OCCASIONAL PAPERS - No:4

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THYSANOPTERA STUDIES I.

Three new tubuliferous Thrips (Thysanoptera, Phlaeothripidae)

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THYSANOPTERA STUDIES 1.
THREE NEW TUBULIFEROUS THRIPS
(THYSANOPTERA, PHLAEOTHRIPIDAE)

Tokuwo Kono
California Department of Agriculture

ABSTRACT: This installment contains descriptions of the following new species: Hoplandrothrips irretius, new species, on nursery stock from Texas; Liothrips brevitubus, new species, on willow in California; and Liothrips monoensis, new species, on Purshia tridentata in California.

I wish to express my thanks to Dr. Lewis J. Stannard for his encouragement and advice.

Hoplandrothrips irretius, new species

Female (macropterous). Length, distended, exclusive of antennae, 2.38 mm. Dark brown except for apical half of all tibiae, all tarsi, and apex of antennal segment II, basal three-fourths of antennal segment III, basal half of antennal segments IV, V, and VI, which are yellow; antennal setae hyaline, terminal setae dark brownish yellow, and all other setae light brownish yellow. Body with red subintegumental pigment.

Head (Fig. 1), 1.1 times longer than wide; cheeks widest back of eyes, converging gently to a point near base where they converge abruptly to base. Cheeks with bristle-bearing warts. Dorsal surface of head reticulate only at base of head; cheeks closely and transversely striate. Eyes 0.4 as long as dorsal length of head; not prolonged ventrally beyond posterior dorsal eye margin. Anterior ocellus borne on a moderately produced vertex; posterior ocelli close to anterior fourth of eyes. Postocular setae infundibulate, 0.4 as long as dorsal eye length. Antennae (Fig. 3), eight-segmented; sense cones short, stout, and rounded apically; sense cone formula

(inner-outer): III, (1-1); IV, (1-1); V, (1-2); VI, (1-2): VII with one dorsally near apex; II with a reniform sensorium near apex. Mouth cone (Fig. 4), short and extending to about middle of prosternum.

Prothorax (Fig. 1), transverse, 1.6 times broader than long; with transverse striae only at posterior margin. Anterior angular setae, epimeral setae, and outer posterior marginal setae well-developed and infundibulate; all other setae very short, acute. Epimeral setae (Fig. 2), 0.3 as long as median dorsal length of pronotum; anterior angular setae 0.4 as long as epimeral setae; outer posterior marginal setae as long as epimeral setae. Epimeral suture complete. Foretarsi (Fig. 6), armed with an inner tooth and an apical claw; femora and tibiae unarmed. Mesonotum (Fig. 8), subreticulate. Metanotum (Fig. 8), striate only on anterior margin and on anterior angles. Mesosternum and metasternum as in Fig. 10. Wings (Fig. 7), hyaline, constricted at middle, with a dorsal outpocketing at the point of constriction. Forewings with six to nine intercalated hairs near apex; with three major subbasal setae, the proximal two setae infundibulate and the distal seta acute.

Abdominal segment I with a cassidiform pelta, subreticulate, as in Fig. 9. Abdominal tergites (Fig. 11), with sculpturing on anterior angles, and distinct on basal half of abdominal tergite IX; abdominal tergites II to VII each with two pairs of sigmoidal wing-holding setae. Outer posterior angular setae of abdominal tergites VI and VII, and terminal setae, acute; all other major posterior angular setae infundibulate. Abdominal tergite IX with major posterior setae shorter than tube. Tube (Fig. 12), 1.6 times longer than abdominal segment IX, and half as long as head. Terminal setae twice as long as tube. Abdominal sternites as in Fig. 16.

Measurements of holotype, in mm.: Length 2.38; head, length 0.252, width across eyes 0.218, greatest width across cheeks 0.237, least width at base 0.196; eyes, dorsal length 0.088; anterior ocellus, diameter 0.015; posterior ocelli, diameter 0.015, interval 0.056, distance from anterior ocellus 0.015; prothorax, median length of

pronotum 0.196, width 0.318; pterothorax, width 0.370; abdomen, width 0.423; tube, length 0.130, greatest subbasal width 0.070, least apical width 0.033; terminal setae, length 0.296; forewings, length 0.876.

Antennal segments:	I	II	III	IV	V	VI	VII	VIII
Length (microns) . .	37	52	70	70	70	63	63	44
Width (microns). . .	41	33	36	33	26	22	19	12

Total length of antenna, 0.469 mm.

Male (macropterous). Length, distended, exclusive of antennae, 2.21 mm. Smaller but similar to female. Forelegs (Fig. 5), with femora incrassate, and bearing one tooth on inner apex; tibiae with one tooth on inner apex and one tooth on inner midpoint; tarsi with an inner tooth and an apical claw. Abdominal tergites (Fig. 13), with sculpturing fairly distinct; tergites VII and VIII (Fig. 14), with bristle-bearing warts laterad; tergite IX (Fig. 15), with prominent warts laterad. Abdominal sternites as in Fig. 17; sternite VIII with an irregular-shaped glandular area visible as stipple membrane.

Measurements of allotype, in mm.: Length 2.21; head, length 0.259, width across eyes 0.204, greatest width across cheeks 0.218, least width at base 0.189; eyes, dorsal length 0.085; anterior ocellus, diameter 0.015; posterior ocelli, diameter 0.015, interval 0.056, distance from anterior ocellus 0.015; prothorax, median length of pronotum 0.229, width 0.330; pterothorax, width 0.394; abdominal segment VI, width 0.336; tube, length 0.133, greatest subbasal width 0.065, least apical width 0.033; terminal setae, length, 0.278; forewings, length 0.920.

Antennal segments:	I	II	III	IV	V	VI	VII	VIII
Length (microns) . .	37	56	70	67	67	63	56	41
Width (microns) . .	41	33	37	37	26	22	19	11

Total length of antenna, 0.457 mm.

Holotype: Female: Cal. Dept. Agr.No. 62D30-1-12; collected in San Diego, California, on nursery stock from Mission, Texas; April 27,1962; G. L. Hill and J. R.

Carlin. Allotype: Male; same data as for holotype. Paratypes: 6♀s, 6♂s; same data as for holotype.

Holotype, allotype, and paratypes will be deposited in the collection of the California Department of Agriculture, Bureau of Entomology, Sacramento, California. Paratypes will be deposited in the collections of the U. S. National Museum, California Academy of Sciences, and Lewis J. Stannard.

This species is a very distinct one, readily distinguishable from its congeners by the absence of reticulations on the metanotum.

Liothrips brevitubus, new species

Female (apterous). Length, distended, exclusive of antennae, 1.90 mm. Dark blackish brown except for apex of antennal segment II, all of antennal segment III, basal half of antennal segment IV, and basal fourth of antennal segment V, which are yellow. Setae of head brown, with tips of all major setae knobbed and white; setae of cheeks and antennae hyaline. Setae of thorax and all abdominal segments except tube brown, with tips of all major setae knobbed and white. Terminal setae acute, brown in basal half and yellow in apical half. Body with red subintegumental pigment.

Head (Fig. 18), 1.2 times longer than wide; cheeks gently arcuate; dorsal surface closely and transversely striate. Eyes slightly less than one-third the head length; not prolonged ventrally beyond posterior dorsal eye margin. Anterior ocellus situated on slightly produced vertex; posterior ocelli situated slightly in advance of middle of eyes. Postocular setae as long as dorsal eye length. Antennae (Fig. 21), eight-segmented; sense cones short, slender, rounded apically; sense cone formula, (inner-outer): III, (0-1); IV, (1-2); V, (1-2); VI, (1-2); VII with one dorsally near apex; II with a reniform sensorium near apex. Mouth cone (Fig. 20), long, pointed, and extending almost to base of prosternum.

Prothorax (Fig. 18), transverse, 2.3 times broader than long; with transverse striae near anterior and posterior margins. All major setae well-developed and knobbed, except inner posterior marginal setae, which are acute. Epimeral setae (Fig. 19), 0.8 as long as median length of pronotum; anterior marginal setae 0.3 as long as epimeral setae; anterior angular setae 0.5 as long as epimeral setae; midlateral setae 0.7 as long as epimeral setae; inner posterior marginal setae 0.2 as long as epimeral setae; and outer posterior marginal setae 0.8 as long as epimeral setae. Epimeral suture complete. Forelegs (Fig. 22), completely unarmed. Mesonotum (Fig. 23), with transverse, anastomosing striae. Metanotum (Fig. 23), subreticulate. Mesosternum and metasternum as in Fig. 25.

Abdominal segment I with a roughly triangular pelta (Fig. 24), subreticulate. Abdominal tergites II to VII (Fig. 26), each with two pairs of sigmoidal wing-holding setae. Abdominal tergite IX with major posterior setae shorter than tube. Tube (Fig. 27), 1.6 times longer than abdominal segment IX, and 0.6 as long as head. Terminal setae 0.8 as long as the tube.

Measurements of holotype, in mm.: Length 1.90; head length 0.233, width across eyes 0.179, greatest width across cheeks 0.196, least width at base 0.181; eyes, dorsal length 0.078; anterior ocellus, diameter 0.011; posterior ocelli, diameter 0.015, interval 0.041, distance from anterior ocellus 0.019; prothorax, median length 0.126, width 0.296; pterothorax, width 0.365; abdomen, width 0.474; tube, length 0.141, greatest subbasal width 0.081, least apical width 0.037; terminal setae, length 0.115.

Antennal segments:	I	II	III	IV	V	VI	VII	VIII
Length (microns) . .	26	52	70	70	67	63	56	35
Width (microns) . .	37	35	30	33	32	32	26	15

Total length of antenna, 0.439 mm.

Holotype: Female; Cal. Dept. Agr. No.45UC115; Calexico, California; March 12, 1945; Anderson; on willow. Paratypes: 2 ♀s; same data as for holotype.

Holotype and paratypes will be deposited in the collection of the California Department of Agriculture, Bureau of Entomology, Sacramento, California.

This species is closely allied to Liothrips lepidus Cott from which it can be separated by the tips of the major pronotal setae, which are knobbed in the former and blunt in the latter, and by the slightly shorter tube.

Liothrips monoensis, new species

Female (apterous). Length, distended, exclusive of antennae, 1.89 mm. Dark blackish brown except for distal fourth of foretibiae, all tarsi, and basal half of antennal segment III, basal third of antennal segment IV, and pedicel of antennal segments V and VI, which are yellow. Setae of head brown, except setae of cheeks and antennae, which are hyaline. Setae of thorax and basal segments of abdomen brown; lateral setae of apical abdominal segments, and terminal setae, yellowish brown. Body with purple subintegumental pigment.

Head (Fig. 28), 1.1 times longer than wide; cheeks subparallel in anterior three-fourths, and converging to base in posterior fourth; dorsal surface closely and transversely striate. Eyes about one-third the head length, not prolonged ventrally beyond posterior dorsal eye margin. Anterior ocellus situated on a slightly produced vertex; posterior ocelli situated close to anterior fourth of eyes. Postocular setae acute, half as long as dorsal eye length. Antennae (Fig. 31), eight-segmented; sense cones slender, rounded apically; sense cone formula (inner-outer): III, (0-1); IV, (1-1); V, (1-2); VI, (1-2); VII with one dorsally near apex; II with a reniform sensorium at apex. Mouth cone (Fig. 30), long, pointed, and extending to base of prosternum.

Prothorax (Fig. 28), transverse, 2.1 times broader than long; with transverse striae at anterior and posterior margins. All major setae well-developed and acute.

Epimeral setae (Fig. 29), slightly more than 0.8 as long as median length of pronotum; anterior marginal setae, anterior angular setae, and midlateral setae equal in length and 0.4 as long as epimeral setae; inner posterior marginal setae and outer posterior marginal setae are, respectively, 0.2 and 0.7 as long as the epimeral setae; midlateral setae are conspicuously curved. Epimeral suture complete. Forelegs (Fig.32), completely unarmed. Mesonotum (Fig. 33), with transverse, anastomosing striae. Metanotum (Fig. 33), subreticulate. Mesosternum and metasternum as in Fig. 35.

Abdominal segment I with a roughly triangular pelta (Fig. 34), subreticulate. Abdominal tergites II to VII (Fig. 36), each with two pairs of sigmoidal wing-holding setae. Abdominal tergite IX with major posterior setae shorter than tube, acute. Tube (Fig. 37), twice as long as segment IX, and 0.9 as long as the head. Terminal setae slightly more than 0.8 as long as the tube.

Measurements of holotype, in mm.: Length 1.89; head, length 0.211, width across eyes 0.174, greatest width across cheeks 0.185, least width at base 0.165; eyes, dorsal length 0.076; anterior ocellus, diameter 0.015; posterior ocelli, diameter 0.015, interval 0.041, distance from anterior ocellus 0.019; prothorax, median length of pronotum 0.118, width 0.248; pterothorax, width 0.359; abdomen, width 0.467; tube, length 0.163, greatest subbasal width 0.081, least apical width 0.033; terminal setae, length 0.122.

Antennal segments:	I	II	III	IV	V	VI	VII	VIII
Length (microns) . .	26	52	63	67	63	67	52	32
Width (microns) . .	33	33	30	32	30	30	26	15

Total length of antenna, 0.422 mm.

Holotype: Female; Cal. Dept. Agr. No. 6309-124; Highway 120 near Mono Craters, Lee Vining, Mono County, California; June 19,1963; T. Kono; on Purshia tridentata.

Holotype will be deposited in the collection of the California Department of Agriculture, Bureau of Entomology, Sacramento, California.

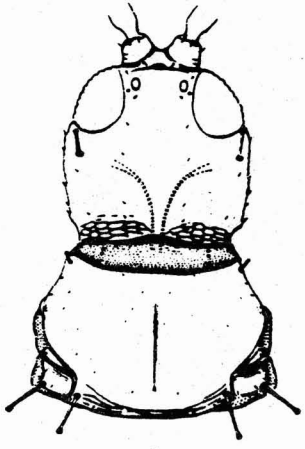
This species is very close to Liothrips ilex (Moulton), but differs from that species in that the reniform sensorium on antennal setment II is situated at the apex, whereas that of the latter is situated near the apex about two-thirds of the distance from the base.

Plate I

Hoplandrothrips irretius, new species

Fig. 1. Dorsal aspect of head and prothorax, ♀.
Fig. 2. Epimeral seta, ♀.
Fig. 3. Dorsal aspect of right antenna, ♀.
Fig. 4. Ventral aspect of head and prothorax, ♀.
Fig. 5. Dorsal aspect of right foreleg, ♂.
Fig. 6. Dorsal aspect of right foreleg, ♀.
Fig. 7. Right forewing, ♀.

Plate I



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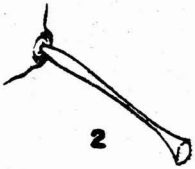

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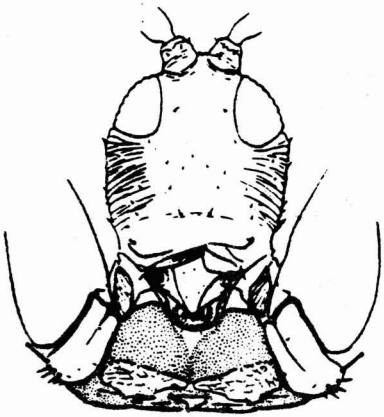

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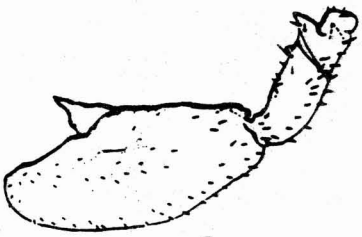

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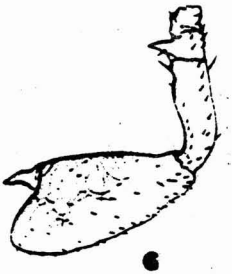

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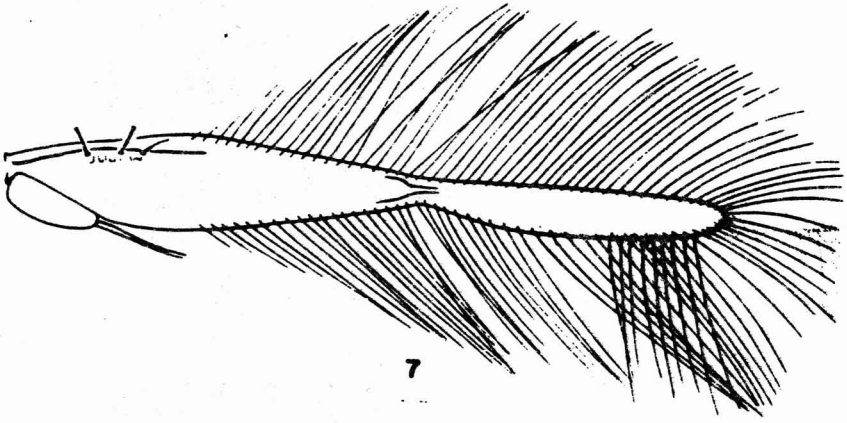

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Plate II

Hoplandrothrips irretius, new species

Female

Fig. 8. Mesonotal and metanotal plates.
Fig. 9. Pelta.
Fig.10. Ventral aspect of pterothorax.
Fig.11. Abdominal tergites VI to X.
Fig.12. Dorsal aspect of tube.

Plate II

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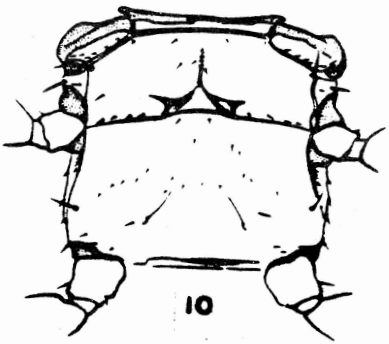

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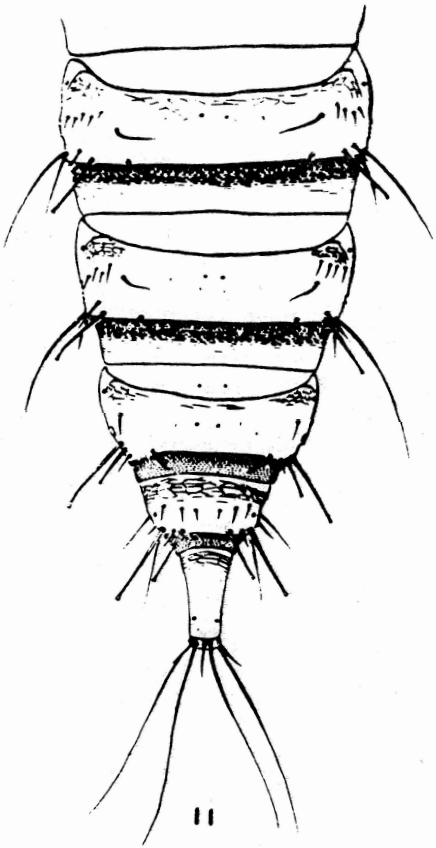

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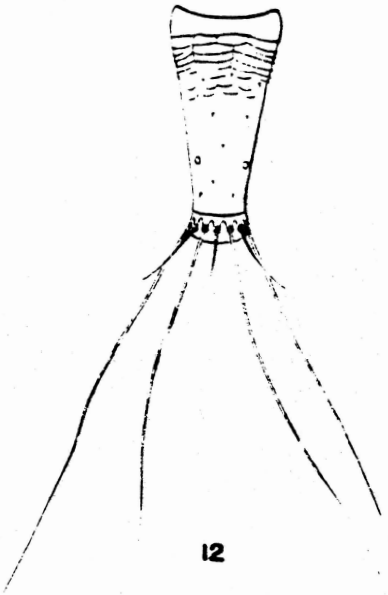

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Plate III

Hoplandrothrips irretius, new species

Male

Fig. 13. Abdominal tergites VI to X.
Fig. 14. Lateral surface of abdominal tergite VII.
Fig. 15. Lateral surface of abdominal tergite IX.

Plate III

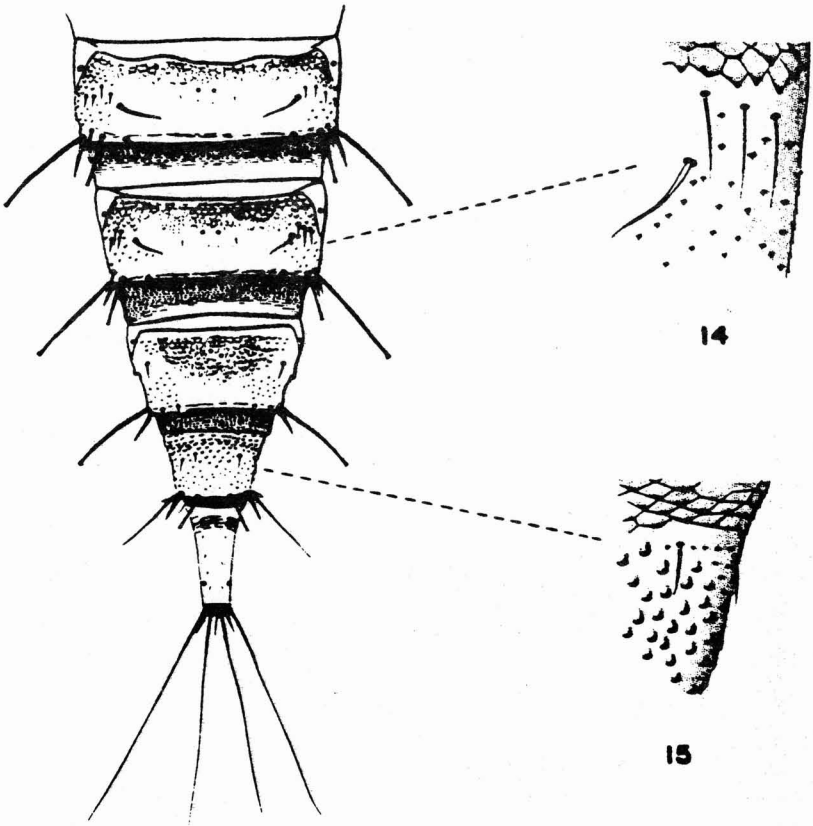

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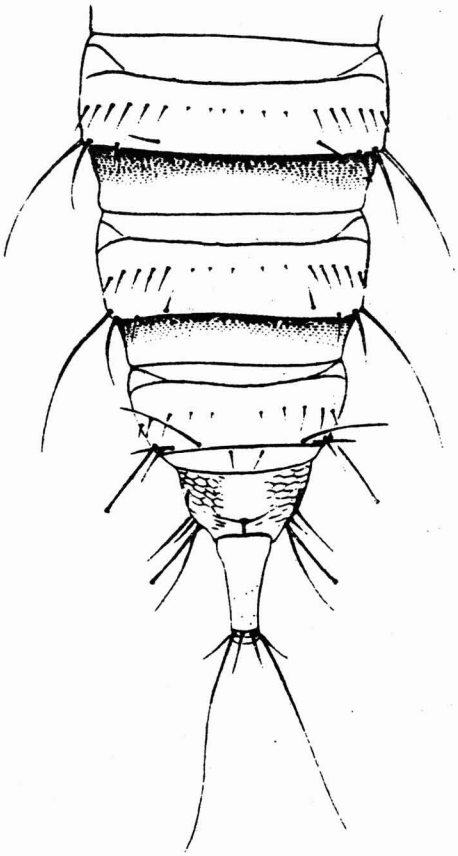
Plate VI

Liothrips monoensis, new species

Female

Fig. 28. Dorsal aspect of head and prothorax.
Fig. 29. Epimeral seta.
Fig. 30. Ventral aspect of head and prothorax.
Fig. 31. Dorsal aspect of right antenna.
Fig. 32. Dorsal aspect of right foreleg.
Fig. 33. Mesonotal and metanotal plates.
Fig. 34. Pelta.
Fig. 35. Ventral aspect of pterothorax.
Fig. 36. Abdominal tergites VI to X.
Fig. 37. Dorsal aspect of tube.

Plate IV



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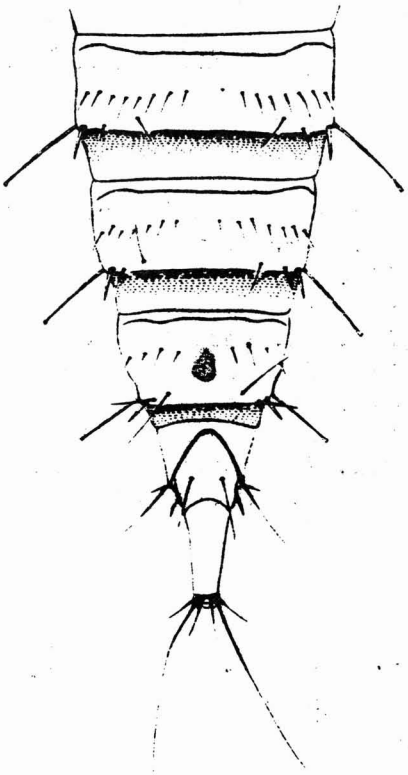

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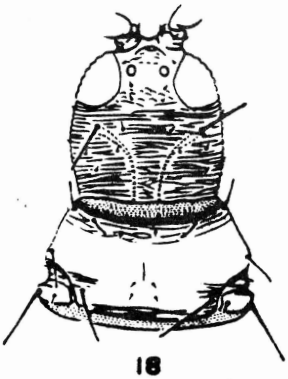
Plate V

Liothrips brevitubus, new species

Female

Fig. 18. Dorsal aspect of head and prothorax.
Fig. 19. Epimeral seta.
Fig. 20. Ventral aspect of head and prothorax.
Fig. 21. Dorsal aspect of right antenna.
Fig. 22. Dorsal aspect of right foreleg.
Fig. 23. Mesonotal and metanotal plates.
Fig. 24. Pelta.
Fig. 25. Ventral aspect of pterothorax.
Fig. 26. Abdominal tergites VI to X.
Fig. 27. Dorsal aspect of tube.

Plate V



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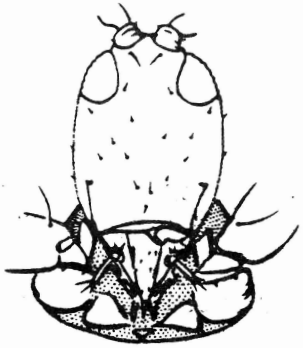

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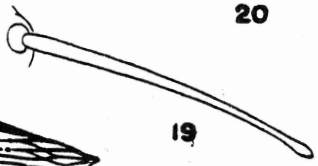

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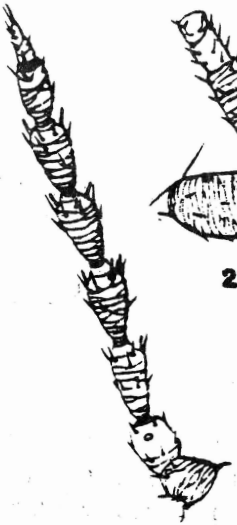

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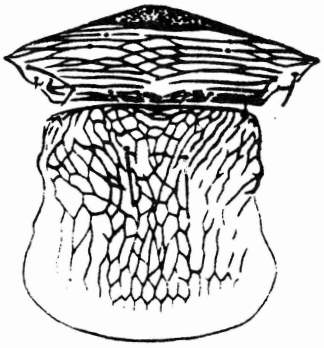

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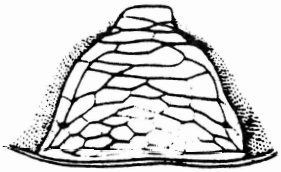

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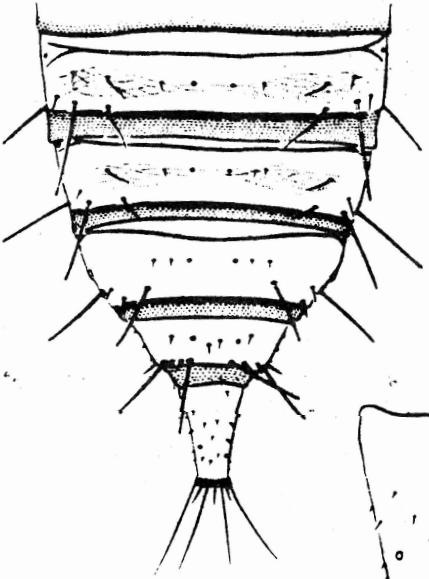

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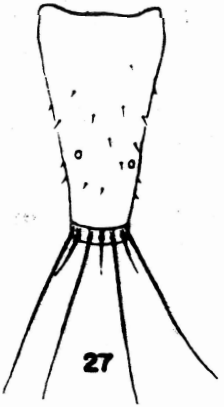

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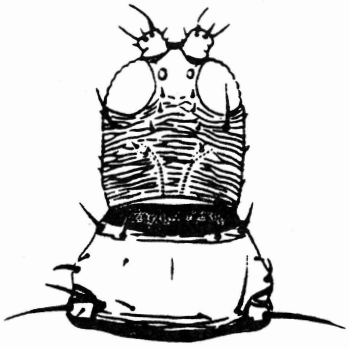
Plate IV

Hoplandrothrips irretius, new species

Fig. 16. Abdominal sternites VI to X, ♀.
Fig. 17. Abdominal sternites VI to X, ♂.

Plate VI



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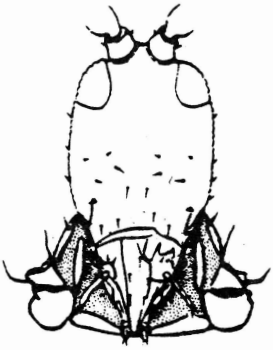

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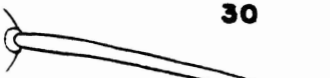

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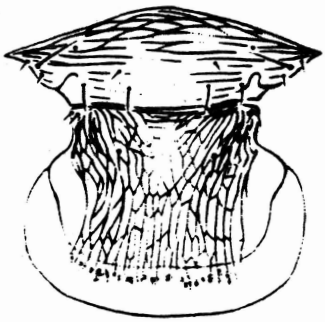

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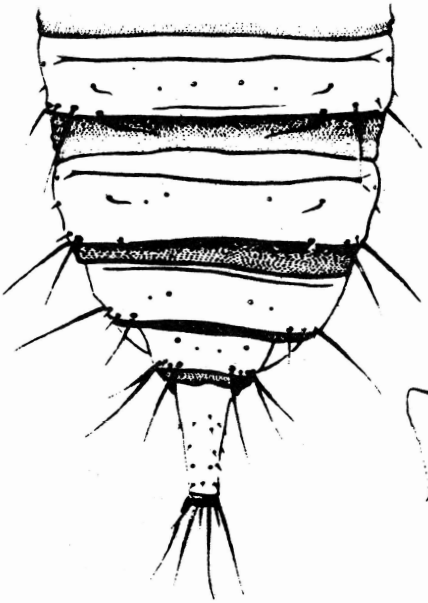

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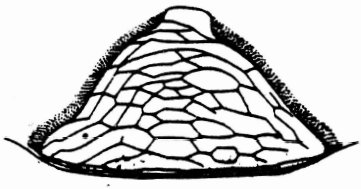

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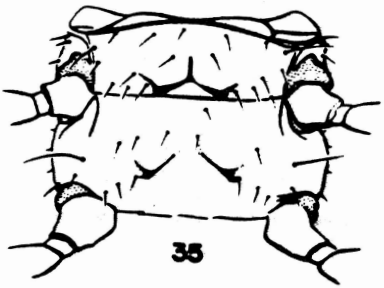

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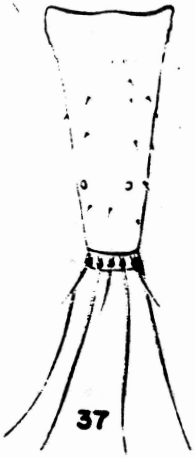

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